

Claim 1

In regard to the recitation of “a space” in line 6 of claim 1, Applicant submits that “a space” is correct. It is not a double inclusion of “the substantially enclosed space” recited in line 2. The space recited in line 2 is above liquid and/or the interior roof and below the fixed roof. The space recited in line 6 is the space between the fixed roof and the newly established blanket.

Applicant has amended line 7 of claim 1 to more clearly recite an opening or vent in structure of the tank or fixed roof.

Applicant traverses the “sub-combination/combination” rejection. In this regard please see comments in the Response mailed 11/5/9, page 3. The Examiner cites no law supporting his position.

Applicant respectfully submits that the rejection is not supported by the facts and the law.

(1) The Term “Difficult” in Claims 1, 5, 8, 17 and 32

Claims 1, 5, 8, 17 and 32 are rejected under §112, second paragraph, as being indefinite for failing to particularly point out and distinctive claim the subject matter which applicant regards as the invention.

Applicant previously pointed out that page 3, lines 8 to 14 (of the PCT specification) explained the meaning of the phrases incorporating the term difficult. “Difficult to extinguish fuel or flammable liquid” or “difficult fuel or flammable liquid fire” are:

“used herein to refer to fluid fuels or flammable liquids that are, at least, in substantial part, low surface tension fuels/liquids and/or high vapor pressure fuels/liquids and/or octane-boosted fuels/liquids and/or oxygenated fuels/liquids. The implied comparison in these instances would be recognized by one of ordinary skill in the art to be with the historic straight chain fuels or historical flammable liquids of the mid-20th century.”

The Examiner replies that the specification does not provide a sufficient standard for ascertaining the requisite degree of the term “difficult” because the specification uses the relative terms “low” and “high” to define the term “difficult.” OA page 11.

Applicant respectfully submits that the specification and common usage in the industry provides a sufficient standard to one of ordinary skill for ascertaining the relative degree of the terms “low” and “high” as used in the above quote. The terms “low surface tension fuels/liquids” and/or “high vapor pressure fuels/liquids” can be and will be given a reasonable meaning in context by a person of ordinary skill in the art. Stored fuels and liquids are categorized in such terms by those of skill in the art. The terms are reasonably precise in the light of the subject matter, to a skilled person in the industry.

One of ordinary skill would understand “low” surface tension fuel/liquids and “high” vapor pressure fuel/liquids, in the above patent context, to mean fuel/liquids that have a lower surface tension or higher vapor pressure than do “the historic straight chain fuels or historical flammable liquids of the

mid-twentieth century.” One test would be whether the surface tension is below the range of surface tensions of “the historic straight chain fuels or historical flammable liquids of the mid twentieth century,” or whether the vapor pressure is above to the range of vapor pressures of “the historic straight chain fuels or historical flammable liquids of the mid-twentieth century.” Surface tension ranges and vapor pressure ranges of “the historic straight chain fuels or historical flammable liquids of the mid-twentieth century” are recited in the literature with generally acceptable accuracy.

The industry by necessity speaks in generalities. One of ordinary skill gives reasonable meaning to “low” surface tension fuel/liquids and “high” vapor pressure fuel/liquids, with appropriate definitiveness, in context in the industry. The industry necessarily deals in significant approximations. Fuels/liquids like gasoline and crude are complex mixtures of chemicals. The necessity to work with generalizations about their attributes, as a whole, such as surface tension and vapor pressure, is accepted in the industry.

Furthermore, attached is a page from the Fire Protection Handbook, as well as its front page. Page 6-6, first sentence in the right column, illustrates that “high vapor pressure” is used without definition in the art. Attached also find a search in the US patent database for patents having high vapor pressure in both the claims and the specification. The second hit is attached. Claim 6 there recites high vapor pressure. The only reference in the specification to high vapor pressure is in a summary of the invention on the top of page 7 where claim 6 is simply repeated, not further defined. Such illustrates that high vapor pressure is a term used in various industries and accepted to have reasonably meaning in context.

The same is true for low surface tension. Attached find a search for low surface tension in the claims and the specification. And a search of low surface tension in just the claims. The latter is a larger list, indicating that it is permitted to use low surface tension in the claims without mentioning the term in the specification. Also attached are two references using low surface tension in the claims; both illustrate the use of low surface tension without definition, indicating that is presumed to be reasonably understood in an industry.

Claims 2 and 3

Claims 2 and 3 have been amended to recite a 2002 NFPA regulated blanket. The 2002 NFPA regulations will not change.

Claim 3 had been previously amended to recite “a last 10 minutes.”

Claim 5

Applicant traverses that the term “difficult” in claim 5 renders the claim impermissibly indefinite. See comments above in regard to claim 1.

Applicant has also amended claim 5 to reword the body of the claim, as suggested, and to recite

that the roof, in line 9, is the fixed roof.

Claims 8 and 9

The last line of claim 8 has been amended to reciting an opening or vent “structure of the tank or fixed roof portion,” for clarity.

5 Claim 8 has also been amended, which applies to claim 9, to recite a “2002” NFPA recommended application rate duration procedure guideline. The 2002 NFPA regulations will not change.

Applicant traverses that the term “difficult” in claim 8 renders the claim indefinite in the context of the industry. See discussion in regard to claim 1, above.

10 Application also traverses the basis for a sub-combination/combination rejection, as above. See prior comments in regard to a “sub-combination/combination” rejection.

Claim 15

15 Claim 15 has been amended to recite, “wherein the interior roof includes a floater.” The cavity is not a double inclusion of the prior cavity because this cavity is defined between the floater and the fixed top roof portion. The prior cavity in claim 8 did not have any recitation of a floater.

Claim 17

In regard to the term “difficult” see above comments in regard to claim 1. In regard to the sub-combination/combination rejection, claim 17 has been reworded, shortening the preamble.

Claim 23

20 Claim 23 has been amended to clarify that the interior roof of claim 17 includes a floater.

Claims 26 and 27

Claims 26 and 27 have been amended to recite the type of flow rate. The basis for the amendments to claims 26 and 27 can be found in the specification on pages 8 and 9, in particular on page 8, line 31 to page 9, line 7.

Claim 32

25 Claim 32 has been amended for clarification. Applicant submits that the preamble and the body of the claim incorporating the preamble are proper and do not violate any “sub-combination/combination” rule. See prior comments in regard to a sub-combination/combination rejection.

The §102 and §103 Rejections

30

First

The Problem addressed by the Invention

The instant specification and invention address the problem of a fire associated with a tank with a fixed roof (Spec pages 1-5) (that retains its fixed roof.) The specification teaches that fire in an industrial storage tank with a fixed roof presents unique problems. (Spec. page 1 lines 23-24.)

Collecting vapors, trapped vapors, in the cavity within the tank present special hazards. (Spec. page 1 line 28; page 2 lines 18-29; page 3 lines 1-14). In the event of a fire in a tank with a (retained) fixed roof, it is standard to address the fire with a foam attack. NPFA provides guidelines for the rate of foam application and the duration of such foam attack, (Spec. page 2 lines 8-10 and 15-16).

5 The instant invention is based on the observation of a problem with the standard practice and is further based upon extensive subsequent experience and testing to provide a solution. See attached Affidavit.

10 Fire of a fuel in a tank with a (retained) fixed roof, defining a cavity below the roof and above the liquid surface, burns at the vents. The vapors collecting within the cavity in the tank, the trapped vapors, one too rich to fully combust. Rather, burning takes place at the tank vents as the trapped vapors slowly exhaust, where the vapor can thin and meet the abundant oxygen of the atmosphere.

15 The inventive discovery was initiated by observing that, after laying down a presumably adequate foam blanket (e.g. more than adequate as prescribed by NFPA rules), the fire of a modern fuel (a blended fuel) in a tank with a fixed roof in Guatemala persisted at the vents for an unacceptably long period of time. Significant vapor was trapped in the space above the blanket and below the roof and continued to burn at the vents. Given a cavity significantly large, the burn time for trapped vapor could be several hours. During this long burn period the blanket could diminish or vanish (such as due to exhaustion of foam concentrate supplies.) Vapors could eventually pass through the blanket and replenish the vapor in the cavity. (See spec page 2, line 18-page 3 line 14).

20 As a result of this experience, Williams extensively experimented with and tested solutions, including the use of dry chem as claimed. It could not have been said that the positive results for the instant claimed apparatus and method were at all predictable or reasonably expected. The opposite was true. See attached Affidavit.

The Inventive Method Claims

25 The independent method claims 1, 8 and 32, as supported in the specification, claim a timing and sequencing of a foam and dry chemical attack to extinguish fire of a fuel in a tank with a significant remaining fixed roof, defining a cavity or space therein. See PCT specification page 2, lines 9 through 17 and page 2, line 26 through page 3, line 1.

30 Claims 1, 8 and 32 recite a timed or sequenced discharge of dry chem (1) into “a space” or “cavity” (this a blind space) defined between an established foam/film blanket and the fixed roof of the tank (2) after the establishment of the foam blanket (which may be variously further quantified by the claims) (3) through openings or vents in the structure of the tank or roof. No direct approach to all visible remaining flames is possible.

Any expectation of success for such a dry chem attack following a foam attack, to extinguish

remaining vent flames fed by rich trapped vapor inside under the roof undergoing incomplete combustion, had to be established by testing. Useful, successful results were not predictable.

Dry chem is a limited resource, measurable in seconds. Discharging dry chem at the wrong time is ineffective and only wastes the resource. (Spec. page 3 line 23; page 9 line 26). The ordinary skilled artisan knows that supplies of dry powder last only a matter of seconds. Thus, the timing and the structuring of a dry powder attack is important. The effectiveness of a dual attack as claimed in claims 1, 8 and 32, had to be demonstrated by testing. It was not predictable and could not be said to be expected. It must waste the dry chem or impermissibly harm the foam blanket. It was surprisingly proven that a “nonselective” application of dry chem., to unseen trapped vapor in a cavity blocked from view, after the establishment of a foam blanket, extinguished the fire without harming the blanket. (See Spec. page 4 lines 1-6.) Such results were not predictable. They had to be proven by experience and testing. See Affidavit attached.

A. Rejection of Method Claims 1, 32-35 Under §102 as Anticipated by Sharma ‘068

Applicant respectfully traverses the rejection of independent method claims 1 and 32 under §102 over Sharma ‘068.

The Law

The way in which the elements are arranged or combined in the claim must itself be disclosed, either expressly or inherently, in an anticipatory reference. “Anticipation requires the presence in a single prior art disclosure of all elements of a claimed invention arranged as in the claim.” *Connell v. Sears, Roebuck & Co.*, 722 F.2d 1542, 1548 (Fed.Cir.1983). The requirement that the prior art elements themselves be “arranged as in the claim” means that claims cannot be “treated...as mere catalogs of separate parts, in disregard of the part-to-part relationships set forth in the claims and that give the claims their meaning.” *Lindemann Mashinenfabrik GMBH v. Am. Hoist & Derrick Co.*, 730 F.2d 1452, 1459 (Fed.Cir.1984). “[U]nless a reference discloses within the four corners of the document not only all of the limitations claimed but also all of the limitations *arranged or combined in the same way as recited in the claim*, it cannot be said to prove prior invention of the thin claimed and, thus, cannot anticipate under 35 U.S.C. §102.” *Net MoneyIN, Inc. v. VeriSign, Inc.*, 545 F.3d 1359, 1371 (Fed. Cir. 2008) (emphasis added).

The concept of “inherent disclosure” does not alter the requirement that all elements must be disclosed in an anticipatory reference in the same way as they are arranged or combined in the claim. “[A]nticipation by inherent disclosure is appropriate only when the reference discloses prior art that must necessarily include the unstated limitation....” *Transclean Corp. v. Bridgewood Servs., Inc.*, 290 F.3d 1364, 1373 (Fed.Cir.2002). “Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing *may* result from a given set of circumstances is not sufficient.” *Cont’l*

Can Co. USA, Inc. v. Monsanto Co., 948 F.2d 1264, 1269 (Fed.Cir.1991) (quoting *In re Oelrich*, 666 F.2d 578, 581 (CCPA 1981))’ *see also Tintec Indus., Inc. v. Top-U.S.A. Corp.*, 295 F.3d 1292, 1295 (Fed.Cir.2002) (“Inherent anticipation requires that the missing descriptive material is ‘necessarily present,’ not merely probably or possibly present, in the prior art.” (quoting *In re Robertson*, 169 F.3d 743, 745 (Fed.Cir.1999))). For a claim to be anticipated, each claim element must be disclosed, either expressly or inherently, in a single prior art reference, and the claimed arrangement or combination of those elements must also be disclosed, either expressly or inherently, in that same prior art reference.

Sharma

Sharma teaches pipe systems for the delivery of foam or dry powder to a tank with a roof. The pipe systems must be separate, because foam pipes have a diameter in the range 150 mm to 250 mm (for the annular rings and cross members) and in the range of 100 mm to 200 mm diameter (for the vertical discharge pipes,) and the diameter of the pipes for the delivery of dry chem is in the range of 50 to 75 mm (for the annular rings and the cross-members) and 25-50 mm (for the vertical discharging pipes.) See Sharma col. 3, lines 18-24. Thus delivering both dry chem and foam with Sharma’s system requires duplicate sets of pipes, of annular rings, of cross-members and of vertical pipes. Duplication is costly. Sharma provides no motivation for the instillation of duplicate systems or any teaching for their joint one. The only “extra” pipe system shown in Sharma’s drawings is for water. See Sharma Fig. 4, element 13. Sharma provides no drawing showing two sets of pipes, one for foam and one for dry chem Sharma teaches no problem solved with a dual foam/dry chem capability, teaches no beneficial results with dual capability.

Sharma neither teaches nor suggests any methodology for using both foam and dry chem on a fire in a tank with a roof. Sharma teaches no timing or sequencing of the use dry powder and foam, if one had dual capability. Sharma offers eight examples: four are for foam only; four are for dry powder only. Sharma does not teach or suggest subsequently discharging dry powder into a space above an at least 90% foam blanket, as per independent claim 1. Sharma neither teaches nor suggests, subsequent to the establishment of a foam blanket on the liquid in the tank with a roof, commencing discharging dry chemical into the space below the fixed roof and above the foam blanket, as per independent claim 32. The possible methodologies, the possible combinations of a foam attack, over one hour or more, and a dry chem attack, over seconds, is virtually limitless. Further Sharma teaches locating nozzles centered in the tank cavity, not at an opening in tank wall or roof.

The Examiner recites that Sharma discloses “the method” (claimed in instant independent claims 1 and 32) and refers to Sharma (1) column 1 line 32; (2) column 4 line 7; (3) column 4 lines 44-46; (4) abstract lines 2-3; and (5) column 4 lines 47-50. These Sharma cites are repeated below:

(1)

“Foam is known for its fire knock-down capability and for blanketing the flammable liquid surface on which it is applied.”

(2)

“At the top ends of the vertical discharge pipes (3) are fixed the discharge nozzles (4) for uniform discharge of foam/dry chemical powder.”

(3)

“As a result, in the event of fire the foam/DCP discharge occurs automatically and is uniformly distributed inside the tank (7) onto the surface (14) of the flammable liquid (15) stored in the tank (7) for the extinguishment of fire.”

(4)

“A device for extinguishing fires in a flammable liquid storage tank uses either foam or dry chemical powder or both, as the extinguishant.”

(5)

“The device of the present invention can be installed for foam/dry chemical powder injection either singly or in combination depending upon the degree of fire hazards to be protected and the fire protection arrangement, therefore, required to be provided in order accomplish the higher fire safety levels.”

It is clear that the above cites do not teach or suggest applicant’s method steps of independent method claims 1 and/or 32. The cites teach no sequencing of the use of foam and dry chem at all or any successful results from sequencing the two discharges. The cites do not teach “discharging dry powder into a space between the roof and the blanket” of claims 1 and 32. The industry (reflected in 2002 NFPA regulations) knows it takes many minutes to establish a foam blanket and that dry chem resources last only seconds. Sharma does not teach holding the dry chem. resources until a blanket is established, by any measure. Quote (3) could reasonably be taken to suggest that if both foam and dry chemical powder (DCP) were used, their “automatic” discharge would occur simultaneously. One of ordinary skill knows that dry chem supplies would inherently be long exhausted prior to the establishment of a foam blanket, or prior to covering at least 90% of the surface with foam.

In conclusion, Sharma does not teach or suggest any methodology for the use of dry chem with foam in a tank fire, much less the methodology of discharging dry powder above an established foam/film blanket, (or an at least 90% established blanket). Applicant’s method of independent method

claims 1 and 32 is neither taught by nor inherent in Sharma.

Applicant submits that claims 1 and 32 are allowable as novel over Sharma, as well as claims 33-35 depending thereon.

B. Rejection of Method Claims 1-3, 8-12, 32-35 over Boyd in View of Williams or Foden

Boyd – In particular independent method claims 1, 8 and 32.

Boyd discloses a foam system for discharging foam into oil tanks provided with covers in the event of fire. Boyd column 1, line 49 – column 2 line 3. Boyd contains no teachings about: (1) any benefit from using dry powder with the foam; (2) structure for using dry powder with the foam; or (3) timing for using dry powder with the foam. The Examiner agrees. “Boyd differs from what is being claimed in the dry powder. Boyd discloses using foam.” See OA page 10.

Foden

Foden is directed to a dry powder composition compatible with foam. Foden discloses testing information for extinguishing fire in an open pan, a pan open to the atmosphere, reachable and treatable by “extinguishers.” The testing teaches a preferred methodology of dry chem first, therefrom. Foden illustrates that his “inventive” dry powder composition does not deteriorate a foam blanket in case of a “reignition.” Foden has no teaching or suggestion in regard to a methodology for extinguishing fire in an “industrial” tank with a roof, in a large tank with a cavity and with unseen incompletely combusting trapped vapors feeding visible flames at vents. Foden has no teaching as to equipment or methodology to address such a fire.

Foden’s sole reference to a use of dry chem after foam relates to small paint or solvent tanks (not industrial scale 60’ foot or greater diameter tanks) where, after the major part of an open fire is extinguished with a “foam extinguisher,” inexpensive “diluted” dry powder can be used on remaining flames in the surroundings.

Thus, Foden’s predominant teaching is:

“Dry chemical compositions in the form of powder are commonly used to extinguish fires, particularly burning liquids such as gasoline. It is sometimes desirable to use these compositions in conjunction with foam: **for example, after a fire has been extinguished with powder a layer of foam may be applied to prevent reignition.** Foden Column 1, lines 11-17.

In line with the above, Foden, column 3, line 59 to column 4 line 60, discloses tests that show the efficacy of powder followed by foam in regard to extinguishing gasoline in an open tank. Foden’s “first series” of tests show that a gasoline fire (in an open tank) can be extinguished with powder. Foden’s “second series” of tests show that a subsequent application of foam cleared in one minute 80% of the fire in an open burning tray of gasoline that was initially extinguished with powder, and then reignited. See

Foden, column 1, lines 11-19. In a “third series” of tests, Foden applies foam to each tray to extinguish the fire. Foden’s powder is applied and the tray reignited to show that the results are no worse than foam alone.

Williams ‘366

Williams ‘366 also discloses the open tank fire scenario. All figures in the Williams ‘366 are of open tank fires. (The external roof has been blown off or sunk.) These fires are referred to in the industry as “full surface liquid tank fires” or “fully engaged liquid tank fires.” There is no trapped vapor issue, no unseen incomplete combustion taking place in secluded quarters.

The open fire presents significantly different problems than a fire in an industrial tank with a fixed roof. See Affidavit attached.

The Williams ‘366’s complete teaching in regard to the use of dry powder in an open tank is:

Preferably, two aerial nozzles would be staged over the tank walls. These aerial nozzles could apply both foam, useful for inner wall cooling, and selected dry chemicals to attack any small persistent flames at the fluid surface.” See ‘366 column 6 lines 15-18. (emphasis supplied)

8. “The method of claim 1 that includes selectively applying dry powder to flames in the tank.”

9. “The method of claim 8 wherein the selective applying is subsequent to substantially covering the tank fluid surface with foam.” See ‘366 column 10 lines 46-49.

The Williams ‘366 only teaches, in eight lines, 5 lines of which are claims*, “selectively” applying dry powder to visible flames in an open tank where an aerial can be staged over the tank walls, e.g. “selectively” applying dry powder directly to flames. See Fig. 3C. There is no teaching or suggestion in regard to fires in industrial tanks with fixed roofs, involving the problems of the incomplete combustion of trapped rich vapor inside, fueling visible fires at the vents. In fact, applying the teaching of the Williams ‘366 to the latter situation would result in the, “selective” application of dry powder “to” the visible flames at the vents. The ‘366 teaches an aerial “staged over tank walls applying dry powder to visible flames, which would be the visible flames burning at the vents, not “the space” inside.

Applicant respectfully traverses the rejection of independent method claims 1, 8 and 32 over Boyd in view of Williams ‘366 or Foden ‘119.

The Instant Method Claims

* [In regard to using the claims of a prior patent as a measure of what the prior art discloses for the purposes of obviousness and anticipation, the Federal Circuit has stated: “the scope of a patent’s claims determines what infringes the patent; it is no measure of what it discloses.” See *in re Benno*, 768 F2d 1340, 1346 (Fed. Cir. 1985)]

The instant invention of independent method claims 1, 8 and 32 claims a methodology of “non-selectively,” so-to-speak, discharging dry chemical. The discharge is “nonselective,” not directly onto visible flames, because the claimed discharge is “into a cavity,” from an “opening,” the cavity housing non-visible rich vapor undergoing unseen incomplete combustion. The cavity is a space between the roof and the blanket, an inherently non-visible “space,” over an established foam blanket. The instant invention is in the context of a fire in an industrial scale tank retaining its fixed roof. The dry chem is discharged through an “opening or vent” (see spec., page 2, lines 4-15, 18-25) in the tank or roof structure. Therefore, there is no “selective” application of dry chem to “flames,” as per the ‘366 or Foden. The instant unpredictable results, shown by testing, (see attached affidavit) include the carrying of the dry chem into all of the space of the cavity between the foam blanket and the roof followed by the extinguishment of all of the fire, and without harming the blanket. The dry chem in the instant application is not used to target “flames,” as per the ‘366 or Foden. The instant visible flames in the closed tank are at and outside of the tank/roof vents. Independent method claims 1, 8 and 32 recite discharging dry chem into a space or a cavity between the blanket and the roof from openings on the periphery of the structure. This is inherently a “nonselective” discharge.

Recap

Boyd does not teach or suggest discharging dry powder; Boyd only discloses using foam. The Examiner agrees. OA page 10, paragraph 11.

Neither Foden nor Williams supply the deficiencies of Boyd. Neither teach discharging dry chem into a “space” or a “cavity” between a foam blanket and a fixed roof through an opening in tank/wall structure as per the independent method claims 1, 8 and 32. Such is not specifically alleged. Foden and the ‘366 teach targeting visible flames with dry chem.

In a tank, Foden, in fact, teaches a preference for powder followed by foam. The only foam followed by powder taught by Foden relates to small tanks first extinguished with a “foam extinguisher,” followed by an application of diluted powder to flames or the surroundings. No “foam” blanket is taught or suggested here as being involved. A large industrial scale (greater than 60’ diameter) enclosed tank is not addressed by Foden. One of ordinary skill in the art would never consider addressing a fire in a large industrial scale enclosed tank with a “foam extinguisher,” as that term is commonly understood. NFPA has different guidelines for small tanks.

The Williams ‘366 does not supply the deficiency of Boyd. The ‘366 does not teach or suggest discharging dry powder into a cavity or space between a fixed roof and an established foam blanket, as per claims 1, 8 and 32. The Williams ‘366 teaches, for an open tank, a “selective” application of dry powder to remnant, visible flames using an aerial staged over the tank walls. The dynamics of visible, discernable open flame vis-à-vis incomplete combustion of rich vapor trapped in an immense enclosed

space, fueling open flame at a vent, are entirely different and distinct. The instant claims cannot be enabled by moving an aerial over the tank wall to selectively target visible flames. The fixed roof and lack of visibility and trapped nature of the vapor involved prohibits such. The instant discharge of dry chem into “the space” may only be affected through openings in tank/roof structure and the discharge is inherently “nonselective.”

Claims 1/3 and 8/9 more specifically recite discharging dry chemical in the last 10 minutes of the NFPA- recommended procedure for foam. Claim 8/11 more specifically recites discharging dry chemical after at least 40 minutes of foam application. Neither Williams ‘366 nor Foden teach these limitations.

Apparatus Claims

Applicant Respectfully Traverses the Rejection of Apparatus Claims 17-18, 20-24 and 25-30 Under §103 (a) as Unpatentable over Boyd in View of Williams or Foden (and Possibly Further View of Baum) – in Particular Independent Apparatus Claims 17 and 25.

The independent apparatus or system claims are claims 17 and 25. All apparatus or system claims address a dry chemical system for a tank with a fixed roof. System claim 25 recites an integrated, fixed foam and dry chemical system structured such that the foam and dry chemical both use the same opening or aperture in the tank or roof structure to supply the foam and dry chemical into the cavity. (Separate channels are supplied.) Apparatus claim 17 recites a fixed or portable dry chemical system discharging into the cavity through a tank vent.

In a tank with a fixed roof, Boyd discloses a fixed foam system discharging through an aperture into a cavity. Boyd has no disclosure about dry chemical, apparatus or systems. The Examiner agrees.

Neither Williams nor Foden supply this dry chemical system or apparatus deficiency. Williams discloses an aerial based dry chemical system useful for an open tank. Williams does not teach a dry chemical supply pipe system rising along a portion of the tank wall for use with a tank with a fixed roof, nor the claimed dry chemical pipe system extending through a tank vent, as per claim 17, or a fixed dry chemical system integrated with a fixed foam system, as per claim 25. Williams does not disclose a dry chemical system integrated with a foam system such that both discharge into the tank through the same opening or aperture in the structure of the tank.

Foden contains no teaching in regard to structure, system or apparatus, fixed or portable, for discharging dry chemical. Foden contains no teaching in regard to a tank with a fixed roof.

Neither Foden nor the ‘366, combined with Boyd, teach or suggest Applicant’s claimed apparatus in regard to a tank with a roof, as per independent claims 17 and 25. None of the references teach: (1) a dry chemical supply pipe system rising along a portion of the tank wall having an end opening into a tank vent (claim 17;) or a dry chemical discharge orifice located interior of the tank communicating with a piping/line integrated with a fixed foam system that is structured to discharge

through the tank aperture, separately and simultaneously with discharging dry chem (claim 25.)

Applicant Respectfully Traverses the Rejection Under §103 – Claims 5 and 7 as Unpatentable over Kaylor in view of Williams or Kaylor in View of Boyd and Williams – in Particular Independent Claim 5

5 **Re claim 5.**

Kaylor and Boyd are recited for teaching a foam system. The Examiner agrees that neither Kaylor nor Boyd teach the third element of claim 5, the dry chemical structure. Williams is cited for teaching the dry powder system.

The Williams '366 does not cure the deficiency of Kaylor and/or Boyd.

10 (1) The Williams '366 does not teach or suggest a “dry chemical conduit fixed to the tank,” in communication with space under a fixed roof through “the opening” used by the foam system (claim 5.) Rather the '366 teaches use of an independent aerial, a portable “over the wall” vehicle-based system, for dry chem, applying dry chem through the open space over the tank.

(2) The Williams '366 does not teach or suggest a dry chemical conduit in fluid communication
15 with the space above flammable liquid and/or internal roof and below the fixed roof of the tank (claim 5.)

(3) The Williams '366 does not teach or suggest a dry chemical conduit in fluid communication with the above space through the same opening used by a foam conduit to communicate with the space.

Hence, Williams '366 does not supply the deficiencies of Boyd or Kaylor and a prima facie case
20 does not lie.

Observation and Testing by Williams

The '366 teaches selectively applying dry powder to the flames. Accord Foden.

The Examiner asserts: “It would have been obvious ... to have provided foam and dry powder in the device of Boyd as taught by Williams or Foden to complete the extinguishing.” (Foden, column 3,
25 lines 5-6) Applicant respectfully traverses.

Foden and the '366 teach the traditional “selective” application of dry powder “to” open, visible flames, by apparatus that can suitably approach and target the flames. Neither contain any teaching as to the effectiveness of applying dry powder to an enclosed “space.” Neither Foden, the '366 nor common knowledge provided a basis for the prediction or expectation of successful results with applicant's
30 claimed invention. It is only the instant disclosure, based upon testing, that teaches that such application of dry powder to cavity over a foam blanket would “complete the extinguishment.” The teaching is based on experiments. Please see attached affidavit.

Conclusion

Applicant submits that a prima facie case in regard to the obviousness of claims 1-4, 8-13 and 15

– 35, based on the references, has not been made.

Applicants have made a diligent effort to place the claims in condition for allowance. However, should there remain unresolved issues that require adverse action, it is respectfully requested that the Examiner telephone Sue Z. Shaper, Applicants' Attorney at 713 550 5710 so that such issues may be resolved as expeditiously as possible.

For these reasons, and in view of the above amendments, this application is now considered to be in condition for allowance and such action is earnestly solicited.

Respectfully Submitted,

7/7/10
Date



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